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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/263,626	03/05/99	MOORE	P PF466

022195
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HM12/0522

EXAMINER	
BRANNOCK,M	
ART UNIT	**PAPER NUMBER**
1646	15

DATE MAILED: 05/22/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/263,626	P.A. Moore et al.
Examiner	**Art Unit**
Michael Brannock, Ph.D.	1646

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Feb 27, 2001*

2a) ☐ This action is **FINAL.** 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *25-50 and 60-151* is/are pending in the applica

4a) Of the above, claim(s) _____ is/are withdrawn from considera

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *25-50 and 60-151* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirem

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other:

Status of Application: Claims and Amendments

1. Claims 25-50, 60-151 are pending.

2. Applicant is notified that the amendments put forth in Paper 13, 2/27/01, have been entered in full.

Response to Amendment

3. The Declaration filed under 37 CFR 1.132 filed as Paper 14, 2/27/01 is insufficient to overcome the rejection of the claims based upon the rejection under 35 USC 101 as set forth in the last Office action, see the discussion of the 101 rejection below.

Withdrawn Objections/Rejections:

4. The rejection of claims 37-40 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, for the reasons put forth in item 9 of Paper 6 and reiterated in item 8 of Paper 11, 8/29/00, is withdrawn in view of Applicants' amendments put forth in Paper 13.

5. The rejection of Claim 37 and 38 under 35 U.S.C. 102(b) as being anticipated by GenEmbl accession number X91553 for the reasons put forth in item 14 of Paper 6 regarding claim 36-38, is withdrawn in view of Applicants' amendment of claim 37(c) to indicate that the claimed nucleic acid is not GenEmbl accession number X91553.

Maintained rejections:

6. Claims 25-50, 60-99 stand rejected and new claims 100-151 are rejected under 35 U.S.C. § 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility, as set forth in item 9 of Paper 11.

Applicant argues that the specification clearly and fully describes the function of CRCGCL and explains why the invention is useful. For support Applicant points page 1, lines 8-9, page 7, line 35 through page 8, line 2, and page 8, lines 32-34. These locations in the specification state that the instant polypeptide is a member of the cytokine receptor family, and as such maybe useful to bind cytokines as does the interleukin-2 receptor gamma subunit. This argument has been fully considered but not deemed persuasive the specification has not put forth which, if any, of the multitude of cytokines the instant polypeptide is a receptor of. Therefore, one of skill in the art would have to perform further research and investigation in order to find out, which, if any, cytokine the instant polypeptides could be used with. Applicant argues that the specification states that the instant polypeptides could be used to activate the Jak/stat pathway, however, the locations in the specification pointed to by Applicant are only invitations to the skilled artisan to begin further research and investigation to try and find some connection between the instant polypeptides and any *particular* relationship with any *particular* Jak/stat pathway. The specification merely recites general properties of known cytokine receptor family members and merely asserts that the instant polypeptides may be useful in "treating deficiencies or disorders of the immune system, by activating or inhibiting the proliferation, differentiation,

mobilization of immune cells (see page 56 lines 1-5) but does provide any specific details as to which of these properties could actually be affected by using the instant polypeptides in any particular way. Example 13, pointed to by Applicant, is merely a protocol for one of skill in the art to use to begin to probe the possible functions of the instant polypeptides, which is only a starting point to begin another round of research and investigation to determine how one could modulate any of the yet discovered functions.

Applicant points to the Declaration of Paper 14 as describing data that affirms the predicted use of CRCGCL in immune cell regulation by binding a cytokine and activating a Jak/STAT pathway. The Declaration attests that when co transfected with IL-7R alpha chan, Jak2 and STAT5, the instant polypeptides bind a specific cytokine TSLP which results in increased tyrosine phosphorylation. This argument has been fully considered but not deemed persuasive for several reasons. The data provided by the Declaration were not present in the specification as filed. The specification does not assert that when co transfected with IL-7R alpha chan, Jak2 and STAT5, the instant polypeptides would bind a specific cytokine TSLP which would result in increased tyrosine phosphorylation. Thus, the Declaration does not affirm any teaching of any particular function because no particular teaching was made in the specification. Thus, using the specification as a guide, one of skill in the art would not have been led to the expectation that the instant polypeptide would bind to TSLP - the examiner can find no mention of TSLP in the instant specification. The results provided by the declaration are precisely the type of further research and investigation that the examiner was referring to in the rejection.

Applicant further argues that the Declaration affirms the predicted use of fragments of CRCGCL to treat disease by inhibiting the action of CRCGCL. This argument has been fully considered but not deemed persuasive because, again, the Declaration does not affirm any teaching of any particular function because no such teaching was made the specification. Applicant argues that in the context of pharmaceutical invention, there is necessarily the expectation of further research and investigation. This argument has been fully considered but not deemed persuasive because the specification has only provided a general assertion of the treatment of disease, i.e. diseases involving the immune system. As there are very few, if any, disease states that do not involve the immune system, the specification has not asserted what can reasonably be considered a specific or otherwise substantial utility.

7. Claims 25-50, 60-99 stand rejected and new claims 100-151 are also rejected under 35 U.S.C. § 112 first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art would not know how to use the claimed invention so that it would operate as intended without undue experimentation.

Applicants' arguments concerning the 35 U.S.C. § 112 rejection as the corollary to the 35 U.S.C. § 101 rejection have been addressed above. Citing case law, Applicant further argues that the claims are enabled in their full scope, i.e. one of skill in the art could make the polypeptides encoded by the claimed polynucleotides and then determine, without undue

experimentation, whether a given polypeptide is able to, for example, bind a cytokine, activate the jak-STAT signal transduction pathway, modulate immune cell proliferation and/or generate CRCGCL specific antibodies.

This argument has been fully considered but not deemed persuasive because the specification has not taught which particular cytokine to test for binding to the variant polypeptides, nor which Jak-STAT signal transduction pathway to activate, nor which immune cells would be amenable to modulation of cell proliferation with the claimed polypeptides. The specification provides a glimpse of the complexity of the different Jak-STAT pathways, see page 86, and it is clear that Applicants' above reference to all Jak-STAT pathways as "the Jak-STAT signal transduction pathway" is a gross over simplification. "The Jak-STAT pathway" does not exist, as there are multiple complex pathways that are known and probably more that have yet to be discovered. The specification has not set forth which Jak-STAT pathway way to test the variants against. The specification has only provided an invitation to one of skill in the art to try to find a function associated with a particular Jak-STAT pathway. Further the Declaration of Paper 14 appears to be in contradiction to the teachings of the specification. The Declaration asserts that the instant polypeptides in conjunction with IL-7R alpha chain bind the cytokine TSLP (thymic stromal derived lymphopoietin), and, by way of Jak2, such binding increased the phosphorylation of STAT5 and Tyk2. However, the specification directs the skilled artisan to search for binding of a multitude of cytokines but does not mention TSLP (see page 85, lines 20-28). Additionally, the specification does not guide the skilled artisan to use the

instant polypetides in conjunction with any IL receptor alpha chain, much less provide guidance to use the IL-7R alpha chain. Further, the specification asserts that preliminary data indicates that the instant polypeptides interact with Jak1 (see page 86, line 1) whereas the Declaration indicates that Jak2 is involved and says nothing about Jak1. Therefore, the issue is not that sequence variants could be created, but that the specification has not taught which variants, of the almost infinite number of variants that could be created, could be made that preserve and/or create any desired functional property of the polypeptide. Nor has the specification taught how to use any of the claimed polynucleotides that encode variants but which do not have any asserted functional properties. While it may be true that functional variants typically contain only conservative variation or variation in non-critical resides or non-critical regions, this teaching does not provide any information as to where these sites of conservative variation, non-critical residues, or non-critical regions could be - such information being necessary to enable the skilled artisan to make and use the claimed invention without undue experimentation. Further, the specification failed to provide guidance as to what any particular functional property of the claimed polypeptide is; nor any particular functional difference between the polypeptide and sequence variants of the polypeptide. Thus, one of skill in the art would not know how to create a variant of a polypeptide having a particular function if that function was not known.

New Rejections:

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 33, 50, 107, 123, 131, 139, and 150 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims 33, 50, 107, 123, 131, 139, and 150 require a composition. A composition necessarily requires more that one component, yet the claims do not recite such a component. Therefore the metes and bounds of the claims cannot be determined. If Applicant deems it proper, one way to obviate this rejection is amend the claims to recite a composition comprising the polynucleotide and a carrier.

Additonally, claim 140 requires that the fragment modulate the differentiation and/or proliferation of immune cells. It is unclear what the word "modulate" is intended to encompase, e.g. enhancement, inhibition, or some other feature. Therefore, the metes and bounds of the claim cannot be determined.

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to

make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 25-50, 60-151 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification discloses a polynucleotide of SEQ ID NO: 1, yet the claims encompass polynucleotides not described in the specification, e.g., sequences from other species, mutated sequences, allelic variants, or sequences that have a recited degree of identity. None of these sequences meet the written description provision of 35 U.S.C. 112, first paragraph. Although one of skill in the art would reasonably predict that these sequences exist, one would not be able make useful predictions as to the nucleotide positions or identities of those sequences based on the information disclosed in the specification.

With the exception of the of the polynucleotide of SEQ ID NO: 1, the skilled artisan cannot envision the detailed chemical structure of the encompassed variants. Therefore, only the polynucleotide of SEQ ID NO: 1, and polynucleotides *consisting* of fragments thereof, but not the full breadth of the claims meet the written description provision of 35 U.S.C. §112, first paragraph.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 26, 42, 116, 124, 132, 140, and 143 are rejected under 35 U.S.C. 102(b) as being anticipated by GenEmbl accession number X91553. Claims 26, 42, 116, 124, 132, and 143 require polynucleotides that are complementary to a polynucleotide of SEQ ID NO: 1 or complementary to polynucleotides of SEQ ID NO: 1 are not GenEmbl accession number X91553. GenEmbl accession number X91553 discloses a polynucleotide that is 100% identical to SEQ ID NO: 1 over the range of positions 778-806 and would therefore encode a polypeptide having a sequence identical to positions 256-264 of SEQ ID NO: 2, and would also be considered to be complementary to both a polynucleotide of SEQ ID NO: 1 and to polynucleotides of SEQ ID NO: 1 that are not GenEmbl accession number X91553. One of skill in the art appreciates that a polynucleotide can be complementary to another polynucleotide without being complementary over the full length, e.g. a probe. Also, as currently worded, these claims do not exclude X91553.

Additionally claim 140 requires that the claimed polynucleotide encode a fragment of SEQ ID NO: 2, wherein said fragment modulates the differentiation and/or proliferation of

immune cells. The polypeptide of SEQ ID NO: 2 comprises a fragment consisting of the amino acid phenylalanine (at position 260, for example). GenEmbl accession number X91553 discloses a polynucleotide that comprises a nucleic acid sequence that encodes the amino acid phenylalanine (see above). It is inherent feature of phenylalanine that it promotes the proliferation of all animal cells (immune cells included) because it is an essential amino acid, see Lodish eds, Molecular Biology, page 193.

Conclusion

No claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Brannock, Ph.D., whose telephone number is (703) 306-5876. The examiner can normally be reached on Mondays through Thursdays from 8:00 a.m. to 5:30 p.m. The examiner can also normally be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler, Ph.D., can be reached at (703) 308-6564.

Official papers filed by fax should be directed to (703) 308-4242. Faxed draft or informal communications with the examiner should be directed to (703) 308-0294.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

MB

May 18, 2001

Primary Examiner